



U.S. Department
of Transportation

**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

NOV 4 2002

Mr. Glenn Rizner, Chairperson
Aviation Rulemaking Advisory Committee
Helicopter Association International
1632 Prince Street
Alexandria, VA 22314

Dear Mr. Rizner:

Thank you for forwarding the Aviation Rulemaking Advisory Committee's (ARAC) Fuel Tank Inerting recommendation. The Federal Aviation Administration (FAA) appreciates the effort put forth by the Fuel Tank Harmonization Working Group in evaluating inerting options and design concepts, preparing the extensive report, and responding to the questions and comments from the ARAC Executive Committee. The agency accepts the report, but recognizes ARAC did not take a position on the report and some Executive Committee members filed individual views. The FAA posted the report, executive summary, addendum, appendices, and individual views on the ARAC web site (www.faa.gov/avr/arm/arac).

After reviewing the working group's report, the FAA formed a small team to design and build an on-board ground based inerting system that would meet the mission requirements developed by the Fuel Tank Harmonization Working Group. This system has been installed on a 747SP ground-test aircraft at the FAA Technical Center. As that system was being constructed, the FAA continued to evaluate methods that could make an on-board fuel tank inerting system smaller, lighter, and use less aircraft pressurized air (engine bleed air). As a result, the team developed an on-board inerting gas generating system (simplified OBIGGS) that appears to be capable of inerting a fuel tank for the entire flight. We are configuring the 747SP inerting system to simulate the simplified OBIGGS and will perform ground tests to produce system performance data. The agency is working on a plan to conduct a flight test of the simplified system to validate in-flight performance. The enclosed documents provide a diagram of the simplified OBIGGS and show how ARAC's concerns are addressed by the simplified OBIGGS.

The FAA considers this acknowledgment and status report as completion of your task, and therefore, closes the task. I would like to thank the aviation community for its commitment to the ARAC process. Specifically, I would like to thank the members of the Fuel Tank Inerting Harmonization Working Group for the time and resources they devoted to this task.

Sincerely,



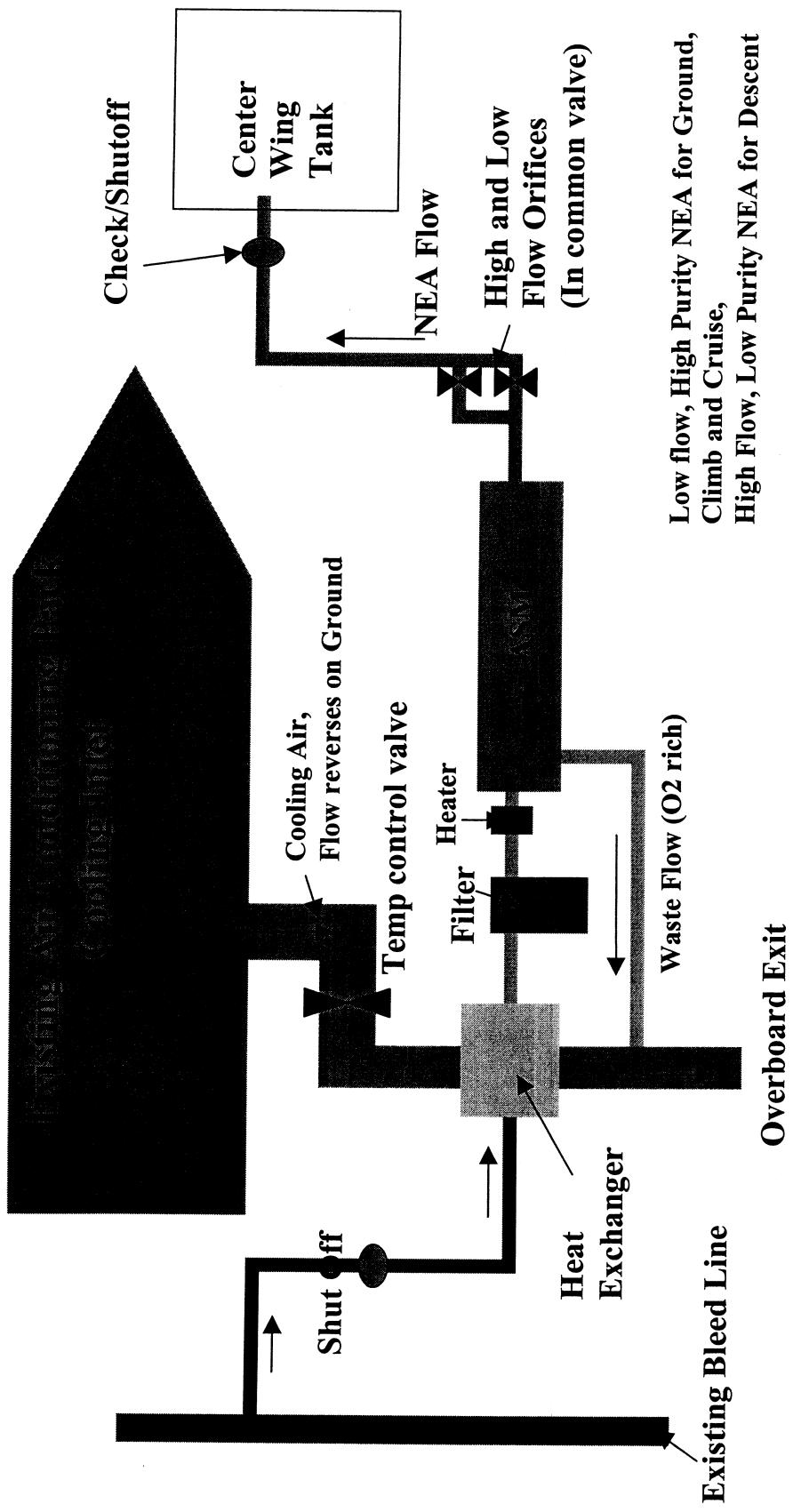
Nicholas A. Sabatini
Associate Administrator
for Regulation and Certification

Enclosure

cc: Mr. Albert Prest

Simplified Onboard Inert Gas Generating System

Full Time Fuel Tank Inerting



FAA Action to Address Fuel Tank Inerting Harmonization Working Group Issues with OBIGGS

Fuel Tank Harmonization Working Group Issue	FAA Action to Reduce Cost
No bleed air available to supply nitrogen separator modules, although no data was provided by the working group or in the report. Therefore, working group determined an electric motor driven air compressor was required. (High electrical load, many moving parts therefore high maintenance costs)	Developed simplified OBIGGS and determined nitrogen separation membranes could inert a transport airplane fuel tank with a flow rate that is too low to calculate any effect on bleed air supply.
Complex nitrogen distribution manifold design using computerized fluid dynamics. The manifold would be installed inside fuel tanks that would uniformly inert each tank compartment. Working group estimated it would require 7 - 10 days of dedicated airplane down time to install on inservice airplanes, resulting in high cost to lease airplanes to replace capacity. Testing of prototype during FAA-Boeing ground based inerting flight test program demonstrated it used more nitrogen to inert a tank that did a similar manifold during lab testing at FAA Technical Center.	Constructed a simple plywood model of the 747SP center wing tank. Testing concluded that a single point inerting nozzle (single tank penetration) was more efficient than the complex distribution manifold. Full scale testing of the simplified manifold on the FAA 747SP ground test airplane demonstrated the single point nozzle not only significantly reduces engineering and installation cost, it uses far less nitrogen than the complex distribution manifold design developed used for the working group cost estimates. A fuel tank service company using standard aerospace practices installed the single nozzle in one day.
Complex designs with motor driven compressor have many moving components resulting in low system reliability.	Simplified OBIGGS has very few moving parts - only the variable flow valve and possibly a cooling fan for heat exchanger operation when on the ground.
Hybrid OBIGGS: Approximately 400 lb. for Large Transport Airplane	Simplified OBIGGS: Approximately 100 pounds (or less) for Large Transport Airplane.
Calculated benefit of inerting reduced by using high benefit for ignition prevention under SFAR 88 preventing accidents.	Industry is finding it difficult to obtain the high estimated benefits they predicted they could achieve with ignition prevention under SFAR 88.